154,391

PERFORMANCE REVIEW

1970 OBJECTIVES

POLYCHLORINATED BIPHENYL ENVIRONMENTAL PROBLEM

1. OBJECTIVE: Reduce and effectively control the PCB content of all effluent from Monsanto plants. All plants to achieve 50 ppb in effluent by January, 1971. [redacted] plants to achieve target of 10 ppb by September, 1971.

   STATUS: The Newport, Anniston and Sauget plants have reduced losses considerably. Losses are still above the 50 ppb target primarily because of prior years' contamination of soil, sewers and the like as well as improperly maintained Therminol heating systems. At Sauget tank truck washing is a prime source of contamination. Measures have been taken to control disposal of the wash liquids. At year end Sauget reports 177 ppb, Anniston reports 321 ppb and Newport reports 54 ppb. The 10 ppb target can be achieved in 1971 with continued tightening of control and probably with the installation of carbon absorption equipment.

2. OBJECTIVE: Inform customers of the PCB problem and the importance of preventing environmental pollution both at their plants or by their products. Inform customers in U.K., Canada and Japan by May 1, 1970; Europe and South America as indicated.

   STATUS: Customers in Canada and the U.K. were informed by July 1, 1970. Customers in Japan, Europe and South America have not been informed pending co-producers actions.

3. OBJECTIVE: To assure tight control on Aroclor usage the use of distributors by the Plasticizers Group will be discontinued by September, 1970.

   STATUS: Achieved. Distributors were informed in May, 1970 that they would not be selling Aroclors after August 30, 1970.

4. OBJECTIVE: Replace Aroclor 1242 in NCR paper coating with monoisopropyl biphenyl for U.S. applications by May, 1971 and with HB-40 for U.K. applications by July, 1970.

   STATUS: U.K. application achieved. U.S. application on target.

5. OBJECTIVE: Develop acceptable substitutes and complete conversion from Aroclor 1254 and Aroclor 1260 in sealants and coatings by August 30, 1970.

   STATUS: Achieved

6. OBJECTIVE: Develop acceptable substitutes and selectively phase out of persistent Aroclor-containing industrial fluids. Complete 20% August, 1970, 40% November 1970, 100% April, 1971.

   STATUS: On target. Pydraul 312 and Pydraul 150 pose major problems.

7. OBJECTIVE: Discontinue sale of polychlorinated biphenyl for cutting oils, pesticide extender, medicinal, dental and cosmetic use by June, 1970.

   STATUS: Achieved.

8. OBJECTIVE: Develop reliable analytical procedures for determining PCB content of liquids, gases and solids. Continue to refine methodology until we reach a level of competence which will provide data whose accuracy will not be challenged. Complete by July 1, 1970.

   STATUS: Achieved.

9. OBJECTIVE: Continue biodegradation work of existing and substitute products at both Ruabon and St. Louis to establish degree of degradation possible and optimum conditions required. Complete by October 1, 1970.

   STATUS: Work continuing and expanding. Program for 1971 will be better defined.

10. OBJECTIVE: Evaluate alternate methods of disposal by incineration - Monsanto operated vs. contract. Complete by July 1, 1970.

    STATUS: Decision was made to install a scrap liquid incinerator at Sauget. Performance of this unit will help determine need for additional units, Monsanto operated or contract operated.

11. OBJECTIVE: Continue the work at Anniston, Krummrich and Dayton on the removal of PCB from water streams. Complete by September 1, 1970.

    STATUS: Results at Krummrich and Dayton although technically successful were determined to be too costly to be of practical value. Work at Anniston on carbon adsorption, flocculation, settling and filtration is highly promising. Engineering evaluation will be completed in first quarter 1971.

PERFORMANCE REVIEW

1970 OBJECTIVES

POLYCHLORINATED BIPHENYL ENVIRONMENTAL PROBLEM

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PRESENTATION OF THE PCB MANAGEMENT PLAN

Last
~~On~~ November ~~17, 1969~~ we discussed with you the PCB problem and outlined a program for coping with it.

(Show transparency on pounds-dollars-return)

On this chart we have summarized the total worldwide business. Our concern is indeed great because of the $21 M worldwide business involved with gross profits of $10 M on a net investment of approximately $9 M.

(Show transparency on non-degradable Aroclors)

The next chart summarizes the business which now depends on the non-degradable (persistent) Aroclors. Solid Aroclors, which are not an environmental problem and Aroclor 1221 which has been demonstrated in our laboratories to respond to degradation, have been excluded.

In November, the decision was made to develop a plan to phase out the manufacture of Aroclor 1254 and 1260. Since then, as you well know, the pollution hysteria continues to grow and specifically in the area of PCB's the number of laboratories,

both governmental and university, involved continues to increase as we predicted.

At this meeting, I wish to bring you up-to-date on the latest developments, the progress we have made, the need for modifying our strategy, and our new strategy.

Since November, the press has been relatively quiet except for the recent flurry following Congressman Ryan's Press Conference. Two publications have appeared which implicate PCB. The January-February, 1970 issue of Environment published in St. Louis carried an article by Dr. Robert Risebrough and Virginia Brodine. The presence of PCB in samples of human milk is first publicly reported in this article. An article by Dr. David Peakall of Cornell University appeared in the April issue of Scientific American. In this article, the effect of DDT and PCB on egg shell formation and reproduction is described, and emphasizes that the problem has been apparent since the introduction of

DDT to the environment. Three newspaper articles were noted, one in the Miami Herald, another in the Tampa Tribune, and the third in the Ann Arbor News, again describing the effects of DDT and PCB on the environment. The Florida papers referred to the effect on shrimp of hydraulic fluid which was traced to our Pensacola plant.

In March, we held discussions with Dr's. Risebrough and Olcutt at Berkeley, California. They are personally convinced PCB's are harmful and were pleased that Monsanto was concerned and cooperative.

Also in March, we participated with about 50 technical representatives representing State, Federal and Canadian Water, Fish, Wildlife regulatory agencies in a very objective discussion in Duluth, Minnesota. Analytical techniques, monitoring of the environment and toxicity of PCB were discussed. Absolute identification of PCB and its effect on the environment were identified

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as requiring considerable research. Concern was expressed by many present that some agency such as the FDA would take precipitous action before adequate information could be gathered; which was believed by many to require at least one year. Monsanto's presence and offer to cooperate was appreciated.

About two weeks ago, we received word from a Dr. Hill, Ohio State Health Department, that his laboratory had found PCB's in milk from an area around Columbus, Ohio. They believed they traced the source of PCB to deteriorating coating applied to silos in 1967. This coating was formulated using Aroclor 1254. We requested samples which our laboratory could analyze and our analytical work has confirmed that chlorinated compounds similar to our Aroclor 1254 are present.

During our discussions with Dr. Hill, we were told that the FDA was considering establishing a PCB limit of 0.2 ppm in food. In pursuing this further, Dr. Kelly was subsequently told by

the FDA personnel that the FDA will, in a few weeks, advise their offices that PCB contents exceeding 0.5 ppm in milk and 5 ppm in food would subject the milk or food to confiscation.

In the U.K. we are, of course, also experiencing considerable concern. The Ministry of Agriculture, Fisheries and Food has repeatedly requested Monsanto to divulge the names of our major customers. From the U.S. point of view, we were reluctant to divulge this information because of possible adverse consequences worldwide. From the U.K. point of view, divulging the customer's name with assurances that it would be kept in confidence is considered the wiser approach in the long run. We are receiving permission from NCR to divulge their name and will approach the Ministry on a confidential basis.

In Europe, we have assumed worldwide leadership and contacted the representatives of the European producers. Initially, their response was indifferent. Subsequently, Bayer, Germany

and Prodelac, France have become more concerned, have initiated programs of their own, and are cooperating with information exchange. The Italian producer does not believe he has a problem. MMK, Japan, has been fully informed of our progress.

During our meeting with General Electric representatives in late January, we discussed our decision to discontinue the manufacture of Aroclor 1254 and 1260. GE immediately challenged the decision on the basis that information available was not adequate to incriminate these Aroclors for electrical use, since other non-degradable ingredients used with Aroclors in dielectric fluids have not been identified in the environment, and that the adverse consequences of fires and explosions far exceed the potential threat to the environment. They also indicated that at the proper time they would be willing to have an officer of their company go on record as stating that the unavailability of these materials would result in serious power blackouts. Without Aroclors the maintenance of existing equipment would be impossible. Replacement of this equipment would be extremely costly, primarily

because of the increased space required by the replacement. The power companies could not provide the uninterrupted service expected.

As you can see, we are still very much on the defensive, however, considerable progress has been made. In our plants, control of emissions is progressing extremely well. After initial audits, all plants instituted programs for control of spillage, leaks and disposal. One plant installed and placed in service this month an interceptor pit to hold major spills. [redacted] and the Krummrich plant are proceeding with similar installations. These should be in service by the end of the third quarter. Reduction in PCB contents of our plant streams below the solubility level in water (50-200 ppb) will be achieved only after research work now underway is completed and plant units are designed and installed. Completion of this work is expected to occur in late 1971.

(Show transparency on plant effluent)

A major development has been achieved by our research department in refining our analytical procedures to the level that we now possess capabilities far exceeding many laboratories and unsurpassed by any. We are actively communicating our methodology to other laboratories to improve the type of information being generated and published. Our objective is to be considered experts with relaible results.

Toxicity studies are now in the tenth month. Data to date indicate that Aroclors are mildly toxic to mammals, however, it is highly unlikely that this will be a significant factor in any decision regarding the banning or restricting of the use of Aroclors.

Biodegradation studies have, thus far, confirmed our initial beliefs that the lower chlorinated biphenyls would degrade easily. We were disappointed in the resistance to degradation of some of the isomers in Aroclor 1242. This would tend to

confirm the belief that some of the 5 and 6 chlorinated biphenyls being found in the environment could be residue from degraded Aroclor 1242. We are actively pursuing the possible use of distilled Aroclor 1242 with degradable components as a possible substitute with minimum loss of other favorable characteristics; e.g. fire resistance.

* (Show transparency on Aroclor Applications)

This chart is a summary of the major uses of the Aroclors which have shown resistance to degradation. Solid Aroclors are not included.

A critical review of these uses was completed. We have classifie these uses into three categories. Business we discontinue, business we retain and business we retain with product substituti

Uses in which control to prevent environmental contamination is virtually impossible are being immediately discontinued as shown on this chart.

* (Show transparency)

The use of Aroclors to extend pesticide persistence, a use developed by the U.S. Department of Agriculture, is not one we have been recommending, however. We still have some extremely minor sales through distributors which we are discontinuing.

We have recommended to the U. S. Department of Agriculture to reject Arodlors as an approved inert material when pesticide rercgistrations occur this year.

We are taking immediate steps to terminate the use of Aroclors for cutting oil, medicinal, dental and cosmetic applications.

We don't know where our distributors are selling Aroclors. To obtain better control of the end uses of Aroclors, we will immediately take steps to terminate distributor selling arrangements as soon as possible.

There are many applications which are extremely difficult to control which we will discontinue, but we will retain the business with acceptable product substitutes.

(Show transparency)

This chart is a summary of those applications for which we either have or will have substitutes. The formulations for sealants, coatings and Industrial Fluids consist of biodegradable Aroclors, chlorinated terphenyls (Aroclor 5000 Series) or phosphate esters.

In the NCR paper application, we are applying considerable pressure on NCR to accelerate the conversion to products we manufacture or propose to manufacture. At present, HB-40 appears promising in the U.K. after one month of plant trials. Alkylated biphenyl appears promising for the U.S. application. We can at present satisfy the HB-40 needs for U.K. by sacrificing some low profit plasticizer business. However, capital funding will be required to expand our production capabilities. We do not at present manufacture alkylated biphenyls, but we have the technology. Facilities must be designed and installed to provide for this application.

Successful control to prevent contamination is possible in systems in which Aroclors are sealed. We are working very closely with our customers to educate and motivate them and have offered technical assistance on their disposal and effluent problems.

Aroclor business which we will retain is shown on this chart.

* (Show transparency)

In summary, we have assumed worldwide leadership in facing the PCB problem. We have educated and pressured our customers and co-producers to fully appreciate the problem. We are leaders in analytical methodology. Our plants are effectively reducing the PCB content of their effluent. We have without waiting for any orders from any agency, selectively and voluntarily discontinued the sale of Aroclors for some uses. We are aggressively developing and introducing product substitutes for uses difficult to control. Where control is possible, we are working hard at making it effective and keeping the business.

We are doing this and at the same time, maintaining the image of Monsanto as a responsible member of the business world genuinely concerned with the welfare of our environment.

MONSANTO WORLDWIDE AROCLOR BUSINESS

POUNDS/YEAR

SALES/YEAR

GROSS PROFIT/YEAR

GROSS INVESTMENT

ROI

WORLDWIDE M/I

MONSANTO PRODUCTION LOCATIONS: USA (2 plants, Anniston, Alabama
Sauget, Illinois)

U.K. (Newport)

JAPAN (Yokkaichi)

OTHER PRODUCERS: Bayer, Prodelec, Caffaro, Flick, Kanegahuchi, and several Eastern European producers (all ex-USA)

WORLDWIDE AROCLOR BUSINESS

PRODUCTS CONTAINING NON-DEGRADABLE AROCLORS

POUNDS/YEAR

SALES/YEAR

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PCB CONTENT

PLANT EFFLUENT

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	Sauget	
April, 1969	700 pounds per day	(3,500 ppb)
March, 1970	200 pounds per day	(1,000 ppb)
Present	65 pounds per day	(325 ppb)
September, 1970	55 pounds per day	(275 ppb)
October, 1970	10 pounds per day	(50 ppb)
September, 1971	2 pounds per day	(10 ppb)

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AROCLOR APPLICATIONS

APPLICATION	M DOLLARS/YEAR
MATTER HAS BEEN REDACTED FROM THIS DOCUMENT	MATTER HAS BEEN REDACTED FROM THIS DOCUMENT

AROCLOR BUSINESS TO BE DISCONTINUED IMMEDIATELY

APPLICATION	SALES M DOLLARS/YEAR	COMPLETION DATE
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AROCLOR BUSINESS TO BE

RETAINED WITH PRODUCT SUBSTITUTES

APPLICATION	SALES M DOLLARS/YEAR	COMPLETION DATE
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AROCLOR BUSINESS TO BE RETAINED

APPLICATION	SALES M DOLLARS/YEAR	REMARKS
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